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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,053	06/29/2005	Fabian E Ernst	US030007US	6087

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EXAMINER	
WANG, CLAIRE X	
ART UNIT	PAPER NUMBER
2624	
MAIL DATE	DELIVERY MODE
02/03/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,053	ERNST ET AL.	
	Examiner	Art Unit	
	CLAIRE WANG	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/29/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 7-15 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claims recite a series of steps or acts to be performed, the claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Claims 12 and 13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 12 defines a computer program for enabling a processor to carry out a method and Claim 13 defines a tangible medium carrying the computer program, which embody functional descriptive material. However, the claims do not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed computer program for enabling a processor to carry out a method can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Any amendment to the claims should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-9, 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Segmentation of multiple motions by edge tracking between two frames (Paul Smith, Tom Drummond and Roberto Cipolla; Department of Engineering University of Cambridge, Cambridge UK; BMVC2000; Hereinafter Smith et al.).

As to claim 1, Smith et al. teach an apparatus for depth ordering of parts of one or more digital images comprising: an input section for receiving the digital images (camera inputs a sequence of images containing motion; Section 4, paragraph 2, line 1); a first regularization means for regularizing image features of the digital images, composed of pixels, by segmentation, including assigning means for assigning at least part of the pixels of the images to respective segments (expectation-maximisation (EM) algorithm calculates the edge probabilities (Figure. 2), wherein the result is an edge segmented image (See Figure 3c)); a first estimating means for estimating relative motion of the segments for successive images by image matching (the motion is then estimated by the EM algorithm for frames 1 and 2; Figure 2); a second regularization means for regularizing image features of the segments by dual segmentation (expectation-maximisation-constrain (EMC) is the second segmentation step; Figure 2),

including a means for finding the edges of the segments, an assigning means for assigning pixels to the edges (EMC generates valid edge labeling; Figure 2), and a means for creating dual segments (Figure 3d and 3d are edge and region labels before and after EMC, thus they are segmenting the image a second time); a second estimating means for estimating relative motion of the dual segments for successive images by image segment matching to determine relative depth order of the image segments (the labeling of a region segmentation is defined by the motion to which each region belongs and the depth ordering of the motions; Section 3.3.1) ; an output section for outputting relative depth ordering of parts of the images (Figure 3 shows sample results being displayed or outputted).

As to claim 2, Smith et al. teach wherein the digital images include frames of a two-dimensional video sequence (inputting frames 1 and 2; Figure 2).

As to claim 3, Smith et al. teach wherein the first estimating means includes a defining means for defining a finite set of candidate values wherein a candidate value represents a candidate for a possible match between image features of two or more images (edges are good features for tracking and they can be matched between frames with good reliability; Section 3.1, lines 1-2); an establishing means for establishing a matching penalty function for evaluation of the candidate values (edge probabilities is calculated; Section 3.1.1); a selecting means for selecting a candidate value based on

the result of the evaluation of the matching penalty function (wherein an edge would fall either in a correct motion model or an incorrect motion model; Section 3.1.1).

As to claim 5, Smith et al. teach wherein the second estimating means includes a calculating means for calculating optimal motion vectors for the dual segments (finding the best fit to the projection of the local vector field at each node); a computing means for computing match penalties for the dual segments (edge probabilities is calculated; Section 3.1.1); a selecting means for selecting a closer segment by comparing the optimal motion vectors (finding the best fit to the projection of the local vector field at each node).

As to claim 6, Smith et al. teach a display apparatus comprising the apparatus as set forth in claim 1 (Figure 3 shows sample results being displayed or outputted).

As to claims 7-9 and 11, they are the method claims of claims 1-3 and 5. Thus they are analyzed in the same way as claims 1-3 and 5. Please see above for detail analysis.

As to claim 12, it is the program of claim of claim 7. Thus it is analyzed in the same way as claim 7. Please see above for detail analysis.

As to claim 13, it is the tangible medium claim of claim 12. Thus it is analyzed in the same way as claim 7. Please see above for detail analysis.

As to claim 14, it is the hardware of claim of claim 7. Thus it is analyzed in the same way as claim 7. Please see above for detail analysis.

As to claim 15, it is the reconfigurable hardware of claim of claim 7. Thus it is analyzed in the same way as claim 7. Please see above for detail analysis.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Braspenning et al. (US 2002/0048402 A1 hereinafter "Braspenning").

As to claim 4, Braspenning teaches a segmentation of digital images (Title), wherein a distance array is created to determine the distance to a closest seed pixel is stored (Paragraph [0025], lines 9-12). Braspenning also teaches that the seed pixels are defined all along the detected hard boarder ([0028], lines 1-2) between two sections next to each other (Fig. 6). Thus, Braspenning's method of segmenting digital images reads on the claimed segmentation method defined by taking a pixel along the border of two neighboring segments as seed pixels, and assigning parts of the remaining pixels to one of the seeds using a distance transform algorithm. Therefore it would have been obvious for one ordinarily skilled in the art at the time the invention was made to combine Smith et al's segmentation of multiple motion by edge tracking between two frames with the segmentation method of Braspenning in order to accurately perform segmentation in sections of the boarder where the segmentation can be determined

easily, which significantly decreases calculation cost and increase calculation speed ([0024], lines 6-11).

As to claim 10, it is the method claim of claim 4. However, it differs from claim 4 in that it further defines the dual segmentation is achieved by means of quasi segmentation (Braspenning [0024]).

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE WANG whose telephone number is (571)270-1051. The examiner can normally be reached on M-F 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew C Bella/
Supervisory Patent Examiner, Art Unit 2624

Claire Wang
01/28/2009